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Office Memorandum • UNITED STATES GOVERNMENT

TO : The Files - Contract RD-107, Task Order 11 DATE: 22 March 1960

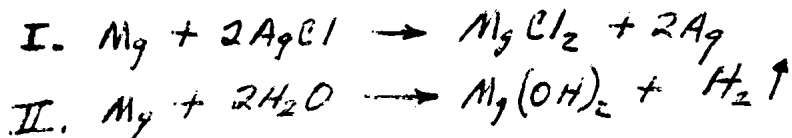
FROM :

SUBJECT: (Trip Report - Development of Water Activated
Battery,

1. On 18 March 1960 a trip was made to the
 to monitor progress on Contract RD-107,
Task Order 11, development of the water activated battery. Present
for discussion were:

2. Negotiations have been completed for a time extension
and overrun and work has been resumed on the water activated battery.
The remaining work will require approximately five months, depending
on the results of some tests yet to be made.

3. At the present time, there are two undesirable features
in the water activated battery. One is the corrosion of the
magnesium plates during the chemical reaction, which has been
corrected for in the past by a timely and costly process of bond-
ing the magnesium to a silver plate. The other undesirable feature
in the battery is the heat generation. In the past this problem
has been solved by cooling the case externally. When activating the
battery, two independent chemical reactions take place:



In reaction I, the electrical output is obtained plus 20% of the
heat generated. Reaction II accounts only for the remaining 80%
of the generated heat. Therefore, it would be highly desirable
to reduce or eliminate reaction II. has
discovered that by the addition of magnesium perchlorate to the

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SUBJECT: Trip Report - Development of Water Activated
Battery

electrolyte, reaction II can be greatly reduced. Also, the magnesium perchlorate acts as a chemical barrier and reduces the corrosive action on the magnesium plates allowing for a cheaper process of bonding the plates. Magnesium perchlorate is inexpensive and is an excellent desiccant, which could aid in keeping the plates dry during storage.

4. Other possible sources of electrical generation were discussed and [] will submit two proposals for consideration by this Office. One proposal will be for a thermoelectric generator which will produce usable electrical energy when the hot junction temperature is above 200°C and will not be damaged by high temperatures (up to 1500°C). This generator will use boiling water as a heat sink and will operate from any heat source that produces at least 200°C. The other proposal will be for a 100 watt fuel cell. This fuel cell will be of the hydrogen-oxygen type and will obtain the oxygen from the air and the hydrogen from a hydrogen generator. This type of generator offers an energy-to-weight ratio of about 100 watt-hours per pound.

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